

## APPENDIX E • ALTERNATIVE COMPARISON OF STANDARDS/GUIDELINES

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**ALTERNATIVE A** (Standards and guidelines for management of the Mexican spotted owl and northern goshawk are those currently depicted in forest plans. See Alternative A description in Chapter 2 for details).

**ALTERNATIVE C** (In Alternative C, the standards and guidelines would be placed in Forest Plans as part of a region-wide amendment.)

### MEXICAN SPOTTED OWL

**Standards:** Conduct Mexican spotted owl surveys in the analysis area prior to habitat modifying management activities. The entire analysis area and suitable and capable habitat within 1/4 mile of the analysis area must be surveyed.

Establish a management territory (core area plus surrounding territory) for every pair of Mexican spotted owls found.

Allow no adverse stand or habitat structure modifying management activities except road construction in the core area at any time. Allow road construction in the core area only when there is no other economically and environmentally reasonable alternative route available and the proposed route is at least 1/4 mile from a known nest tree. New construction activities will be done only outside the breeding season.

Allow no adverse stand or habitat structure modifications within 1/4 mile of the nest tree during the breeding season. If the nest tree is not known, allow no adverse stand or habitat structure modifying management activity within 1/4 mile of the core boundary or 1/4 mile of unsurveyed habitat boundary during the breeding season. Allow no other management activities that would adversely affect the reproductive effort during the breeding season.

**Guidelines:** Retain existing hardwood component greater than five inches diameter at root crown throughout the management territory. At times vegetative treatments, including hardwood removal, may be necessary to perpetuate the hardwood portion of the existing habitat.

Management territories will consist of a 450 acre, or larger, core area for nesting and/or roosting protection plus an additional surrounding 1550 acre or larger territory for a total of at least 2,000 acres. Where possible, the core area should be entirely composed of suitable habitat. Retain a minimum of 1,000 acres of suitable habitat per management territory or the Forest average of the amount of suitable habitat in management territories; retain whichever number of acres is greater.

Suitable Mexican spotted owl habitat should be managed to produce multi-storied canopies with canopy closures greater than 60 percent for mixed conifer and 50 percent for ponderosa pine, pine oak, or other Forest cover types. Capable Mexican spotted owl habitat should be managed to promote development of its present condition to a suitable condition.

Mexican spotted owl breeding season is normally February 1 through August 31.

Approximately 50 percent of the forest matrix exterior to established management territories should be managed as dispersal/foraging habitat. The forested areas selected should have trees nine inches dbh or greater with an average canopy closure of 40 percent or greater (see Mexican spotted owl biological opinions issued by USFWS from August through December 1993).

Minimum survey areas should be about 640 acres. For very small analysis areas such as a campground, the survey area should be expanded to cover 640 acres. Follow R-3 Survey Protocol when conducting surveys. At

the discretion of the biologist management territories may be established for territorial individuals. The shapes and exact sizes of management territories will be determined by the biologist.

Generally, limit adverse stand or habitat structure modifying management activities in a territory to less than a cumulative total of 500 acres. Generally limit the number of territories where adverse activities are occurring in any one year to less than 10 percent of the management territories on each National Forest.

Initiate surveys at least 2 years in advance of habitat modifying management activities. If owls are located during the first year of inventory, establish the appropriate territory. If owls are not located during the first year of inventory, conduct a second year inventory prior to implementing the habitat modifying activity. Inventory timing and approach can be adjusted with concurrence from the U.S. Fish and Wildlife Service. Because of changing occupancy and potential for colonization of new sites; after the second year survey if more than two years pass before a decision is signed or project implemented, at least one year of additional survey should be conducted prior to implementing the management activity. If birds are discovered after the final decision is signed or during project implementation, appropriate territories should be established and management activities adjusted to minimize adverse affects to MSO habitat or the birds reproductive success.

Created opening size in management territories should be no more than two acres.

Forest plan guidelines may need to be adjusted if they conflict with MSO Recovery Plan objectives. The recovery plan is expected from U.S. Fish and Wildlife Service by no later than 1996. At that time Forest Supervisors will evaluate any needed changes in their respective plans. Needed amendments will be made by the responsible official as per the National Forest Management Act regulations.

## **NORTHERN GOSHAWK**

**Standards:** Northern goshawk surveys must be conducted in the entire analysis area and appropriate adjacent areas prior to habitat modifying management activities.

A nesting home range (nest area, post fledgling-family area, foraging area) must be established for every goshawk pair.

No adverse habitat modifying management activities are allowed in active nest areas at anytime and are allowed in the associated post fledgling-family areas only outside the breeding season.

Allow no management activities within 1/4 mile of active nest sites that would adversely modify habitat characteristics or adversely affect the reproductive and rearing effort during the breeding season.

For each selected project action, a Biological Assessment and Evaluation will be prepared to document effects to forest-wide population viability before a final project decision is made.

**Guidelines:** Nesting home ranges of approximately 6000 acres will consist of three suitable nest areas (about 90 acres total), three replacement nest areas (about 90 acres total), post fledgling-family area (about 420 acres), and foraging area (about 5400 acres). The shape and exact size of the nest home range will be determined by the biologist approving the Biological Assessment and Evaluation.

Survey for at least one year in advance of habitat modifying management activities. Because of changing occupancy and potential for colonizing new sites; after the initial inventory if more than two years pass before a decision is signed, at least one year of additional survey should be conducted prior to implementing the activity. If birds are located during the survey, establish appropriate home range areas. If birds are discovered after the final decision is signed or during project implementation, appropriate home ranges should be established and management activities adjusted to prevent adversely affecting the habitat or the birds reproductive success.

Breeding season is generally March 1 through October 1.

Suitable nest areas will be mature and old forests (VSS 5&6) with 50-70% + canopy cover. Select replacement nest areas from sites that resemble vegetation and landforms for suitable nest areas.

On average based on site potential, about 60 percent of the post fledgling-family areas and foraging areas should be mid-aged to old forest (VSS 4-6). About 10% of the area should be in grass/forb/shrub (VSS 1). Canopy cover percents should be 50 to 70 percent plus in the post fledgling-family area and 40 to 60 percent plus in the foraging area. The canopy cover percents on the low end of the range are for ponderosa pine and the percents at the higher end of the range are for spruce-fir.

Created openings in post fledgling-family areas should not exceed 2 acres and in foraging areas should not exceed 4 acres. When created openings are one or more acres in size, 3 to 6 reserve trees/acre of opening should be left.

There should be 2 to 3 snags per acre and 3 to 5 downed logs per acre. Woody debris should be 5 to 15 tons per acre. The lower snag, downed log and woody debris numbers are for ponderosa pine; the higher numbers for spruce-fir types.

Within nesting home ranges, identify key ungulate forage monitoring areas. These key areas will normally be 1/4 to 1 mile from water, located on better soils on level to intermediate slopes, and be readily accessible for grazing. Size of the key forage monitoring areas could be 20 to 500 acres. Within key forage monitoring areas, select appropriate key species to monitor average allowable use.

Within nesting home ranges, average key species forage utilization in key forage monitoring areas by domestic livestock and wildlife should not exceed levels in the following table during the forage growing season.

ALLOWABLE USE GUIDE (percent) BY RANGE CONDITION AND MANAGEMENT STRATEGY

Range	Continuous Season-long Use	Defer 1 yr. in 2	Defer 1 yr. in 3	Defer 2 yr. in 3	Rest 1 yr. in 2	Rest 1 yr. in 3	Rest 2 yr. in 3	Rest over 2 yr. in 3
Very Poor	0	5	0	10	10	5	15	25
Poor	10	15	10	20	15	10	30	35
Fair	20	25	20	30	25	20	40	45
Good	30	30	30	35	30	30	40	45
Excellent	30	35	35	35	35	35	45	50

The above table is based on composition and climatic conditions typical of sites below the Mogollon Rim. On sites with higher precipitation and vegetation similar to sites above the Mogollon Rim, allowable use for ranges in poor to excellent condition under deferment or rest strategies may be increased by 5%. Allowable use for management strategies not covered in the above table and for allowable use during forage dormant periods are not covered in the above table. In these latter situations, allowable use will be determined through the Integrated Resource Management (IRM) process to meet specific ecosystem conditions, which will also be monitored in key areas.

## **OLD GROWTH**

**Standards:** Maintain 20 percent of the forested area within each ecosystem management area to meet old growth (Structural Stage VSS-6) habitat needs.

**Guidelines:** If the existing old growth percentage is less than the desired minimum amount, maintain all existing old growth and use the IRM process to determine the best forested areas (Structural Stages VSS-4 and VSS-5) for recruitment of potential old growth to meet the minimum percentage.

If the existing old growth percentage is more than the desired minimum amount, maintain the needed old growth from the best areas and manage the remaining old growth areas to meet the desired conditions established in the IRM process.

The location and block size of old growth maintained will be determined through the Integrated Resource Management (IRM) process to meet desired ecosystem conditions. Overtime, areas maintained in old growth may move around the forest as the natural processes of growth and ecosystem disturbance have always caused it to do. Old growth sites will be distributed throughout the forest in all forest vegetation types.

The Southwestern Region Old Growth Core Team developed old growth descriptions and allocation procedures in September, 1992. Refer to Forest Service Handbook 2090.11, R-3 Supplement, Sections 1.4 and 1.7 for additional guidelines.

**ALTERNATIVE D** (The northern goshawk standards and guidelines presented here are taken directly from a jointly submitted letter commenting on the draft EIS from both the Arizona and New Mexico game agencies. They are presented below exactly as submitted. The Mexican spotted owl standards and guidelines were developed by a Forest Service and Fish and Wildlife Service team to respond to the Mexican Spotted Owl Recovery Plan. In Alternative D, the standards and guidelines would be placed in Forest Plans as part of a region-wide amendment.)

#### **MEXICAN SPOTTED OWL**

(Standards and Guidelines are exactly like Alternative G for the Mexican spotted owl)

#### **NORTHERN GOSHAWK**

The following management recommendations for ponderosa pine are supported by both the Arizona Game and Fish Department and the New Mexico Department of Game and Fish as a means of addressing some of their concerns identified in their comments on the Forest Plan Amendments DEIS. Goshawk habitat includes the entire ponderosa pine, mixed conifer and spruce-fir forest cover types in the southwestern United States. In addition, all other forest cover types (i.e., pinyon-juniper) may be important, but the importance of those forest types remains unknown at this time. The intent of the following recommendations is to sustain approximately 40% of the landscape in old forest (large old trees) through time. This will be achieved by maintaining the existing matrix (VSS 5) to old forest (VSS 6) structure across the landscape until an average of 20% of the landscape contains VSS 5 and 20% contains VSS 6.

#### **INVENTORY**

**Standard:** Search the entire analysis area, during the goshawk breeding season, for nesting goshawk before the habitat modifying project begins. Two years of inventory are required.

#### **TERRITORY**

**Standard:** Establish a 6,000 acre management territory for all known goshawk breeding areas (one breeding area may contain several nest sites).

As per RM-217, establish three 30-acre nesting areas that are currently used or suitable for use by goshawks. Establish three 30-acre replacement nesting areas that will be managed to become available for use when the existing nesting areas become unusable. Designate a 600-acre Post-fledgling Family Area (PFA) that includes the six nest areas. Establish a 5,400-acre foraging area around each PFA. If the foraging area recommendations described in the following sections are applied outside goshawk territories, the 5,400-acre foraging area designation would be unnecessary.

**Guideline:** If the three replacement nesting areas cannot be located within the existing PFA, designate a replacement PFA and manage it to be available for use when the replacement nest areas become suitable for use. Map the boundaries of nest areas, PFAs, and foraging areas on USGS 7.5 minute topographic maps and, if available, on a Geographic Information System.

### **MANAGEMENT SEASON**

**Standard:** No adverse management activities are allowed at any time in the nest area. If PFAs are occupied during the breeding season, management activities are allowed from October through the end of February. In unoccupied PFAs, management activities are allowed from July through the end of February. Management activities are allowed year-round outside the PFAs.

### **HABITAT MANAGEMENT OUTSIDE GOSHAWK PFA's AND ACROSS THE LANDSCAPE**

**Standard:** Areas with high site potential (due to elevation, aspect, soils, hydrology etc.) will be managed according to the conditions outlined in Table 1. For example, an area with a site index of 90, having a SDI of 35% and managed at a 250 year rotation will have 56% of the landscape in VSS 5 and VSS 6. Also apply the standards and guidelines listed below for stand structure, lands classified as unsuitable, canopy cover levels (Table 1), forest age, reserve trees, shortages in VSS 5 & VSS 6, hiding and thermal cover and old-growth, to areas outside of goshawk territories in ponderosa pine forest cover type.

**Guideline:** The objective is to: 1) sustain as much mature and old forest across the landscape as possible, 2) provide future habitat for goshawk PFAs and improved habitat for other forest wildlife, 3) allow for future expansion of wildlife populations into currently unoccupied but potentially suitable areas, and 4) to provide wildlife movement corridors. Additional wildlife and ecosystem benefits are expected because of the longer rotation and management at the group, patch, site and landscape levels. Many high potential sites are located on north facing slopes and/or in drainages. These locations provide both denser forest habitats (including Goshawk PFAs) and movement corridors.

Low sites may not support the size and density of trees we would like. Conversely, high sites will exceed the growth that is described by the GSC. The intent, therefore, is to grow as many large, old trees as possible over time.

### **STAND STRUCTURE**

**Standard:** Follow uneven-aged management within and outside goshawk territories with the option of managing up to 20% of the area outside of PFAs in even-aged patches greater than 4 acres, but not to exceed 100 acres in size.

**Guideline:** The intent is to develop a mosaic of forest vegetation structural stages that are interspersed throughout the landscape. Also, this will provide flexibility for managers to address forest health issues, consider existing even-aged sites (stands) larger than 4 acres, manage urban interface areas where fire management is important, provide for wildlife habitat needs, and maximize biodiversity. Because the current proportions of VSS 5 & VSS 6 (mature and old forest) are in short supply, the intent is not to reduce this limited resource.

### **TREATMENT IN LANDS CLASSIFIED AS UNSUITABLE**

**Standard:** Treatment in lands classified as "unsuitable" and/or "not capable" is allowed when the treatment is in a manner compatible with the reason for the classification and will maintain and protect wildlife values such as ponderosa pine stringers, fringe habitat, and ecotones. The intent is to provide an opportunity to restore fire to the ecosystem and not to permit commercial timber harvest on slopes greater than 40%.

## **CANOPY COVER MEASUREMENT**

**Standard:** Vertical projection is the standard for measuring canopy cover.

**Guideline:** Convert densiometer measurements to vertical projection values by subtracting 13% (Edminster, in prep.) until better information is available.

## **CANOPY COVER LEVELS**

**Standard:** Follow canopy cover levels in Table 1.

**Guideline:** For smaller trees in the 9 to 12 inch size class, the desired future forest condition is to have groups of trees managed toward the 40% canopy closure, group structure, and distribution desired in the VSS class 4. Areas with low site potential (Site Indices less than 60) may not be capable of attaining the desired canopy closure (40%) but should be managed to attain the 40% canopy closure wherever possible. Trees in some areas of VSS 3 and 4 have low live-crown ratios because of existing high tree densities. To remedy the situation, canopy closure in VSS 4 may be reduced to 30% in areas outside the PFA and 40% in the post-fledgling family area where the average live crown ratio for a patch is less than 40%. In very dense VSS 3 (i.e., greater than 120 square feet of basal area per acre) where the live crown ratio is low, a gradual reduction (successive treatments) in tree density is necessary to provide for an intermediate crown closure on up to one half of the VSS 3 acres in an assessment area.

The intent of the policy is to have variability in canopy cover and tree density at multiple scales (i.e., group, patch, and site level). How this variability at multiple scales is defined and applied on the ground is still being discussed between the Forest Service and the other wildlife management agencies. The AGFD has recently submitted a proposal to address this issue in its comments on the Kaibab Forest Plan DEIS.

Use the best available information to determine desired canopy cover and improve management application. Also, use the best data available to determine which site, patch or group densities provide the desired canopy closure. There is still disagreement between the Departments and the Forest Service on the design and implementation of harvest prescriptions that will achieve the described canopy cover level. The Departments do not agree with the implementation on the Kaibab National Forest as described in the Kaibab National Forest Implementation and Interpretation (KNFI&I) Guidelines (see AGFD white paper).

## **FOREST AGE**

**Standard:** The ponderosa pine landscape will be managed under a rotation age of 250 years.

**Guideline:** A 20-year entry for silviculture treatments is preferred. The intent is to have healthy forests with large, old trees with old growth characteristics interspersed through the areas. Healthy forests have endemic levels of insects, disease, and some decadence. On sites of lower productive capability (estimated site index 60 or less), trees may have old-growth characteristics but be unable to grow to the large VSS 6 size. However, sites of high productive capability (estimated to be site indices of 80 or greater) are expected to produce VSS 5 & 6 across more than 40% of the assessment area.

## **RESERVE TREES**

**Standard:** Leave 4 live reserve trees, 18 inches DBH or greater in size, per acre in VSS 1-4.

**Guideline:** The standard applies regardless of the presence of snags. The intent is never to remove reserve trees once they have been identified. Reserve trees 18" DBH or greater in size are generally considered "yellow pine". Reserve trees are never cut. The intent of leaving reserve trees across the landscape is to provide: 1) large old green trees, 2) large-quality snags for the future to replace existing snags, and 3) future large down logs to replace the existing down logs. Snags and large down logs are critical habitat components for the survival of primary goshawk prey and for the maintenance of wildlife species diversity.

Reserve trees are in addition to the required snags per acre. Reserve trees on one acre can not be used to make up for a shortage on another acre. If more than 4 reserve trees exist, and VSS 5 & VSS 6 are limited, these reserve trees will be managed as a group of VSS 5 or VSS 6 and not as a VSS 1-4.

### **SHORTAGES IN VSS 5 AND VSS 6**

**Standard:** Leave all trees of VSS 5 (18-24 inch dbh trees) & VSS 6 (trees larger than 24 inches dbh) size when there is a deficit of these VSS groups in the assessment area. An assessment area is generally 10,000 to 15,000 acres in size.

**Guideline:** RM-217 recommended having approximately 40% of the landscape in VSS 5's and 6's. For goshawk territories where there is a shortage of area containing VSS 5's and VSS 6's, all trees 18 inches and larger dbh are to remain. In rare instances when forest health is an extreme problem, treatment is allowed. General treatment to control insect and disease is not a valid reason to harvest large trees in deficit situations. Because the current proportions of VSS 5 & VSS 6 (mature and old forest) are in short supply, the intent is not to reduce this limited resource. Selection of assessment areas should be based on ecological criteria and should not be designed to make large trees available for harvest.

### **REPORTING VEGETATION DATA**

**Standard:** Use the 6 class vegetative structural stage (VSS) system published in RM-217 for reporting tree frequency data in your project file.

**Guideline:** Display the VSS distribution by site capability (low, site index less than 60; medium, site index 60-80; high, site index greater than 80) in project documents. Also show current VSS distribution, VSS distribution immediately after treatment, and the desired future VSS distribution. The intent is to use a consistent communication tool between the Regional Office, Forests, sister natural resource agencies, non-governmental organizations, and other interested parties. In addition, for each goshawk territory within an analysis area affected by a project, show the current VSS distribution, the proposed VSS distribution by alternative immediately after silvicultural treatment is completed, and the desired VSS distribution. If the VSS distribution is lowered below the percentage recommended by the GSC, document why the deviation occurred and how the deviation will reach the desired distribution faster than alternatives not selected.

### **HIDING AND THERMAL COVER**

**Standard:** Meet current LMP standards and guidelines for cover.

Hiding cover is a necessary habitat component for goshawk prey and other wildlife. Flexibility is present within the GSC recommendations to include hiding cover while, at the same time, moving the current vegetative condition toward the Desired Future Condition (DFC). However, in the interim, before the newly planned regeneration areas have trees that are of sufficient cover size, it may be necessary to provide cover by temporarily leaving some areas in a dense condition. Current LMP standards and guidelines need to be revisited in light of the shift in management emphasis toward uneven-aged management.

### **OLD-GROWTH**

**Standard:** Treatments in old-growth (whether designated, allocated, or unclassified) are limited to tree "thinning from below" and use of fire to control regeneration.

#### **Guidelines:**

##### **I. Management in Allocated Old-growth**

Prior to any treatment, determine the VSS distribution within areas already allocated as old-growth. Acres in each VSS class within allocated old-growth will be applied to the overall VSS distribution in goshawk territories or analysis areas. Treatments to adjust VSS distribution will occur outside allocated old-growth. Existing blocks of allocated old-growth will be maintained where they occur.

Treatments in allocated old-growth will be designed to enhance the old-growth attributes described above and will be limited to the following:

Existing old-growth - For not at-risk old growth, thin from below, less than 5" dbh and use prescribed burning. For at-risk old growth, thin from below, less than 12" dbh and use prescribed burning. "At-risk" implies serious imminent ecological damage, not merely the presence of mistletoe or insects.

Developing old-growth - thin from below, less than 12" dbh and prescribed burning .

Developing old-growth is distinguished from existing old-growth by having, on a stand basis, fewer than 14 trees/acre greater than or equal to 18" dbh. In managing developing old-growth, priority will be placed on maintaining those components that are hardest to replace.

## II. Management in Unallocated Old-growth

A. If blocks greater than or equal to 100 acres of old-growth exist, allocate these as existing old-growth and manage them according to the strategy for allocated existing old-growth described in Section I.

B. If blocks greater than or equal 100 acres of old-growth do not exist, allocate blocks of 100 acres or more by combining existing blocks and adjacent developing old-growth. Manage these areas under the strategy for allocated developing old-growth described in Section I.

Management actions outside of these guidelines will be proposed by the Forest Service only in the event of impending catastrophic events and will be preceded by an interagency coordination meeting. The purpose of the meeting will be to explain the need for the action, project objectives, project design and potential alternatives to meet the project objectives.

These recommendations do not replace or supersede existing agreements on management of old-growth reached during settlement of Forest Plan appeals.

Treatments are limited in old-growth because of 1) the scarcity of old-growth, 2) the uncertainty that the unique habitat attributes of old-growth can be reproduced silviculturally, and 3) the length of time necessary for the development of old-growth. Old-growth is being maintained to retain old-growth characteristics for a variety of wildlife species and to conserve already scarce old-growth throughout the Region. The intent is to maintain all existing allocated blocks of old-growth, to allocate old-growth where it has not yet been allocated and to enhance old-growth attributes in areas of developing old-growth.

### Old-growth Attributes in Ponderosa Pine Type Are:

#### A. General attributes:

Large, old, yellow-bark trees; wide, long, smooth plates; heavy limbs; flat crowns; greater than or equal to 18" dbh (greater than or equal to 14" dbh at low sites); most trees over 200 years old (Thomson, Walter G, 1940), A growth rate classification of southwestern ponderosa pine. J. For. 38:547-553). Poor sites may not grow trees with all of these characteristics.



**B. Desired Future Condition:**

1. 2 snags/acre minimum (snag = greater than or equal to 18" dbh, greater than or equal to 30' tall)
2. 3 downed logs/acre minimum (downed logs greater than 12" dia. and greater than 8' long)
3. 5-7 tons of woody debris/acre minimum (woody debris, greater than or equal to 3" diameter)
4. Allocate and maintain at least the LMP minimum area requirement as allocated old-growth per Section 1 above.

The intent is that all old-growth attributes identified above will be present in VSS 6. VSS 5 should have most of these attributes present and is intended to provide all of these attributes in situations where site capabilities will not allow achievement of the dbh identified for VSS 6.

**CANOPY COVER LEVELS**

**Standard:** Follow Canopy cover levels shown in Table 1 below.

**Table 1. Minimum patch canopy closure at year one after treatment.**

VSS Class	Outside Goshawk Post-fledging Family Areas			Post-fledging Family Area		
	SI <sup>1</sup> <60	SI 60 TO 80	SI >80	SI <60	SI 60 TO 80	SI >80
4	40%*	40%	50%	50%*	1/3 60% 2/3 50%	1/3 60%, 2/3 50%
5	40%*	40%	50%	50%*	50%	50%
6	40%*	40%	50%	50%*	50%	50%
9-12 inch dense VSS 3, ≥ 120 BA	40%*	Up to 1/2 the area 50%, the remainder 30%	Up to 1/2 the area 50%, the rest at 40%	50%*	Up to 1/2 the area 50%, the rest at 40%	Up to 1/2 the area 50%, the rest 40%
9-12 inch in less dense VSS 3, ≤ 120 BA	30%*	30%	40%	40%*	40%	50%

<sup>1</sup> Site capability

\* canopy closure to be reached if site conditions permit

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**ALTERNATIVE E** (The following alternative was suggested by Applied Ecosystems, Inc. Slight changes in their submission were accomplished to make the format consistent with the presentations in other alternatives.

## **FOREST HEALTH**

**Standards:** Immediately implement the Forest Health Restoration Initiative (USDA Forest Service, 1993) on every Forest in the Region.

**Guidelines:** Reduce overall tree densities on those acres identified as having the highest tree densities from the land areas to be managed. The key point here is that specific acres have been identified by the USFS to-date as currently being in a severely overstocked and suppressed condition. This condition currently supports a high probability of crown fire and, until this event occurs, a forest condition which is made up of unhealthy trees in the overstory and paucity of biological diversity in the understory. These specific acres should be thinned so that: the resultant condition promotes individual tree growth and vigor; overstory canopies are made more diverse and less susceptible to crown fire; and biological diversity is increased in the understory flora and fauna.

Reduce forest fuel loadings on those acres identified as having the highest fuel loadings from the land areas to be managed. Again, immediate action should be taken so as to reduce current fuel loadings from these high risk areas to levels which will support controlled prescribed burning in the short-term (within five years from this initial treatment).

Modify vegetative conditions on those acres identified as having a high potential for damages caused by insects and diseases.

Eliminate the risk of catastrophic fire to those urban interfaces identified as "high risk of wildfire" in the initiative.

Minimize risk to catastrophic loss from fire, diseases, and insects. Promote individual tree growth. Reduce overall tree densities across the landscape and provide residual trees in clumps with these clumps providing associated high tree densities. To use the terminology of Percent Canopy Cover (%CC) expressed as vertical crown projection as an example, forest landscape values should range from fifteen to forty percent with tree clump densities ranging from forty to one hundred percent.

Develop landscapes where grass and forb species predominate. Promote species richness and abundance in the "lesser" vegetation and in the associated faunal organisms. In keeping with the terminology of %CC, sixty to eighty five percent of the area should be outside of the vertical projection of tree crowns and fully occupied by grass and forb species.

Improve woody vegetation size and age class compositions and reintroduce fire as a natural disturbance regime.

## **DESIRED FOREST CONDITION**

**Standards:** Establish a Desired Forest Condition (DFC) for each District which is specific to the following types of land areas: ponderosa pine; mixed conifer; spruce fir; and pinyon/juniper or woodland. This standard will enable the USFS to work towards the attainment of its programmatic management objectives of: forest health; biological diversity; and ecosystem sustainability. This District-specific DFC will be used on each land area as a management target and will be subtly refined to provide management flexibility when the Integrated Resource Management (IRM) process is implemented on the land area. The DFC must be attainable given the current condition of the vegetative resources and must be ecologically sustainable given the land to be managed is in the southwest United States.

**Guidelines:** Use the landscape descriptions provided in the Forest Health Restoration Initiative (USDA Forest Service, 1993).

Use the landscape descriptions provided in the DFC Unit Concept and related DFC Vegetation Tables (Applied Ecosystem Management, Inc., 1993, unpublished).

## **PINYON-JUNIPER WOODLANDS**

### Stand Structure

**Standards:** Manage for lower tree densities in PJ Woodlands.

**Guidelines:** Reduce tree density by 50% in 20 years.

**Standards:** Reestablish desert shrub and grasslands in areas where PJ invasion has occurred.

**Guidelines:**

- 100% tree removal.
- Use burning, seeding, and appropriate range management techniques to reestablish presettlement conditions.
- Reestablish fire as a natural disturbance regime.

### Soil and Watershed Quality

**Standards:** Minimize soil erosion to improve watershed quality.

**Guidelines:**

- Reduce tree density.
- Increase grass and forb production.
- Implement prescribed burning.
- Consider seasonal climatic effects on watershed quality and schedule management projects as to not adversely affect this quality.

**Standards:** Rehabilitate riparian areas.

**Guidelines:** Restore the vegetative condition of the associated watersheds. Increase stream flow.

## **ASSESSMENT AND PLANNING FUNCTION**

**Standards:** For each Ranger District throughout the National Forest System, establish a land area assessment schedule so that all of the District lands are assessed in a systematic and timely fashion.

**Guidelines:** Delineate the District land area as follows and implement the associated management cycle for each land area:

Forest Type: 1/10 to 1/20 per year, every year

Woodland Type: 1/5 to 1/15 per year, every year.

**Standards:** Identify contiguous land areas upon which Integrated Resource Management (IRM) is applied.

**Guidelines:** Use the management cycle identified and divide this into the total District acreage for each land area type. For example, assume the following:

Forest Type: 150,000 total acres with a 15 year management cycle equals 15 contiguous land areas, each 10,000 acres in size.

Woodland Type: 200,000 total acres with a 10 year management cycle equals 10 contiguous land areas, each 20,000 acres in size.

Other criteria which should be used to delineate these individual land areas are spatial aggregation of high risk conditions and landscape feature such as drainages and watersheds.

*(Signature)*

Display these land areas to be managed in map form and organize data and information systems at these levels. Identify each of these land areas with a unique name and/or number.

**Standards:** Sequence the identified land areas to be managed so that the most effective and efficient movement is made towards achieving programmatic land management objectives (forest health, biological diversity, ecosystem sustainability).

**Guidelines:** Land areas with the highest assessed risk to catastrophic loss from fire, disease, and insects are ordered with the first management priority.

Land areas with the greatest difference between their current vegetative condition and their desired vegetative condition are ordered with the next level of priority.

**Standards:** Implement IRM on each identified and sequenced land area each year through the management schedule.

**Guidelines:** Perform the following work activities:

1. Data collection and information development;
2. Synthesis to description of current vegetative condition;
3. Comparison of current vegetative condition to desired vegetative condition;
4. Selection of silvicultural tools to manage the current towards the desired as soon as possible, and
5. Develop a range of alternatives to be assessed to attain the desired vegetative condition.

### **IMPLEMENTATION FUNCTION**

**Standards:** Apply the intervention measures identified from the IRM process on each land area each year through the management schedule.

**Guidelines:** All acres in each land area are available for treatment and should be thoroughly assessed as to the immediate need for applied treatments so as to manage them towards the desired condition.

Both even-age and uneven-age silvicultural systems are available. Emphasis will be placed on the use of uneven-age silvicultural systems because the resultant forest condition probably more closely approximates natural vegetative conditions across the landscape (namely, group sizes of a few acres, not tens of acres). Even-age silvicultural systems must remain available for the timely intervention of high risk disease and insect conditions. The particular silvicultural systems to be used on any given land area will be determined from the IRM process.

All types of slash treatment measures are available.

Low intensity, frequent, ground fires should be re-established as an ongoing disturbance regime.

### **MONITORING FUNCTION**

**Standards:** Perform a monitoring function on each National Forest each year. The area which is monitored is a selected land area from the management schedule.

**Guidelines:** It is important to note that the monitoring function must be the responsibility of the "line Officer" and that this function is performed on a land area where a management project has been designed and implemented. Monitor the following elements of management on the selected land area:

1. Data collected and information developed (i.e., do we know what we need to know?);
2. Synthesis to a description of the current vegetative condition (i.e., has the vegetation across the land area been fully described and presented in an understandable format?);
3. Comparison of current condition to desired condition (i.e., what are the comparative strengths and weaknesses between what the vegetation is today and what we want it to be?);

NOTE: a holistic assessment must be made of the entire range of vegetative conditions which make up both the current and the desired. For example, little trees are as important as are big trees.

4. Selection of management tools to be applied to move the current towards the desired;
5. Implementation of the management tools (eg.: acres treated by silvicultural type; acres prescribed burned; etc.) and;
6. Post-treatment vegetative condition (i.e., were management objectives met?).

### **MEXICAN SPOTTED OWL**

**Standards:** MSO surveys will be conducted in project areas prior to management activities under established protocol.

Management territories will be established for all MSOs found according to ID #2 protocol.

Vegetation modifying activities in all areas of the MSO management territories will be allowed after review through the IRM process.

All projects will proceed following procedures according to the Endangered Species Act.

**Guidelines:** Management territories will generally consist of 400 acre core area and 950 acre territory for forests in Arizona and a 300 acre core and a 750 territory for forests in New Mexico.

Management activities and acres of treatment in MSO territories will be determined through the IRM process and have no limitations.

Roost areas will generally be 3 acres in size with a 50% or greater canopy closure.

Nest areas will generally be 3 acres in size with a 70% or greater canopy closure.

Created openings in MSO territories will generally be no more than 4 acres in size.

Vegetative conditions in MSO core areas will be the same as for the northern goshawk PFAs.

Vegetative conditions for the remainder of the MSO territory will be the same as the northern goshawk foraging area.

### **NORTHERN GOSHAWK**

**Standards:** Goshawk surveys will be conducted on each project area according to established protocol.

Goshawk management territories (home ranges, i.e., nest areas, post-fledging family area, and foraging areas) will be established for territories confirmed to be occupied by pairs of goshawks.

Vegetation modifying activities in goshawk management territories will be determined through the IRM process.

**Guidelines:** Goshawk management territories (home range) will generally be 6000 acres in size (415 acre PFA which includes 180 acres of nest sites and 5585 acres of foraging area).

All nest sites will be 20 acres in size and comprised of three types existing, mid-term replacement, and long-term replacement.

Three existing nest sites will generally be managed to sustain vegetative structural classes (VSS) 4, 5, and 6.

Three mid-term replacement nest sites will generally be managed for VSSs 3, 4, and 5 in order for these vegetative structural classes to grow into suitable goshawk nest sites.

Three long-term replacement nest sites will generally be managed for VSSs 2, 3, and 4 in order for these vegetative structural stages to grow into the mid-term nest sites.

Nest sites will generally be managed for canopy closures to average in range between 50% and 70%.

Approximately 55% of the area in PFAs will be comprised of VSSs 4, 5, and 6. The PFA will be managed to attain canopy closures within a range of 30% and 50%.

Approximately 50% of the area in foraging areas will be comprised of VSSs 4, 5, and 6. Foraging areas will be managed to attain canopy closures between 20% and 40%.

Openings in PFAs and foraging areas should not exceed 4 acres unless other management needs, determined through the IRM process, call for larger than 4 acre openings. Openings will include up to 3 reserve trees.

#### **WILDLIFE COVER**

**Standards:** There will be no specific management direction to manage for wildlife cover.

Cover, if necessary, will be supplied by the existing and managed vegetative condition.

#### **ALLOCATED OLD GROWTH**

**Standards:** Allocate ten percent of all acres from each land area managed.

**Guidelines:** Select the ten percent allocation from all acres making up the land area under management. This allocation should represent a range of land area types characterized by: site capability; forest type; and topographic features.

**Standards:** Of the ten percent allocated from each land area:

- Restore one half to the natural "presettlement" vegetative condition across contiguous acres; and
- Attempt to keep the other one half in its current vegetative condition across contiguous acres.

**Guidelines:** Employ whatever silvicultural treatments and slash treatments necessary to achieve a "restored" vegetative condition immediately after treatment.

Employ whatever silvicultural treatments and slash treatments necessary to sustain the current vegetative condition for as long a time as possible.

**Standards:** Monitor all "old growth" allocations.

**Guidelines:** Measure the following attributes of the allocated "old growth" acres in each land area: vegetative condition (trees, grasses, and forbs); forest fuel condition; soil; and wildlife species and abundance.

**ALTERNATIVE F** (All standards and guidelines are exactly like Alternative C, except in mixed-conifer on the Apache National Forest, where the following standards and guidelines would apply.

## **NORTHERN GOSHAWK (Mixed-Conifer Apache NF Only)**

**Standards:** Manage the mixed-conifer vegetation type on the Apache National Forest as an ecosystem demonstration area to achieve the Desired Conditions described in the guidelines below.

**Guidelines:** Track existing and desired conditions in the mixed-conifer vegetation type on the Apache National Forest. Annual comparisons of conditions will be used to monitor and evaluate progress towards Desired Conditions. Develop an annual report of monitoring activities.

Zone 1 includes areas of 40% plus slope on north aspects (approximately 23,915 acres with no acres available for management). The Desired Condition in Zone 1 is to allow for natural evolution and processes to achieve a dense, late seral condition of the forest.

Zone 2 includes areas of 20-39% slope on north aspects (approximately 39,510 total acres with 22,111 acres available for management). The Desired Condition in Zone 2 is to manage the forest using unevenaged silvicultural methods to achieve an all aged, late seral forest condition with large trees, adequate snags, down woody materials and multiple stories. Manage for 25 to 40 percent of maximum stand density index (SDI).

Zone 3 includes areas of 0-19% slope on north aspects (approximately 35,000 total acres with 28,951 acres available for management). The Desired Condition in Zone 3 is to manage the forest using unevenaged silvicultural methods to achieve an all aged, late seral forest condition with large trees, adequate snags, down woody materials and 2 to 3 stories. Manage for 25 to 40 percent of maximum stand density index (SDI).

Zone 4 includes areas of 40% plus slope on south aspects (approximately 11,470 acres with no acres available for management). The Desired Condition in Zone 4 is to allow for natural evolution and processes to achieve a dense, late seral condition of the forest.

Zone 5 includes areas of 20-39% slope on south aspects (approximately 24,736 total acres with 14,384 acres available for management). The Desired Condition on 40 to 60% of Zone 5 is to manage the forest using unevenaged silvicultural methods to achieve an all aged, late seral forest condition with large trees, adequate snags, down woody materials and multiple stories. The Desired Condition on the other portion of Zone 5 is to manage the forest using evenaged silvicultural methods to achieve moderately large trees, adequate snags, down wood material, and a single storied stand. Manage for 25 to 40 percent of maximum stand density index (SDI) with a rotation age of 150 years.

Zone 6 includes areas of 0-19% slope on south aspects (approximately 33,613 total acres with 28,434 acres available for management). The Desired Condition on 40 to 60% of Zone 6 is to manage the forest using unevenaged silvicultural methods to achieve an all aged, late seral forest condition with large trees, adequate snags, down woody materials and multiple stories. The Desired Condition on the other portion of Zone 6 is to manage the forest using evenaged silvicultural methods to achieve moderately large trees, adequate snags, down wood material, and a single storied stand. Manage for 25 to 40 percent of maximum stand density index (SDI) with a rotation age of 150 years.

**ALTERNATIVE G** The standards and guidelines for the Mexican spotted owl were developed in response to the Mexican Spotted Owl Recovery Plan. Where possible these standards and guidelines reflect an ecosystem management philosophy. However, because of the owl's listed status, the standards and guidelines are heavily single species oriented out of necessity.

The standards and guidelines for managing in the home ranges occupied by northern goshawk represent an ecosystem management approach. The approach used for managing goshawk habitat areas provides for many wildlife species, timber, and forage. Soil productivity, fire, woody debris, large diameter snags and downed logs, microorganisms, mammals and birds, and forest health and productivity (all elements of functioning forest ecosystems) are addressed in the standards and guidelines. As a result the standards and guidelines for ecosystem management in goshawk habitat areas are not focused on any single species or element. The standards and guidelines for ecosystem management in goshawk habitats were developed by an interdisciplinary group of Forest Service scientists and take in to account the current manual direction, Goshawk Interagency Implementation

Team recommendations, the report Management Recommendations for the Northern Goshawk in Southwestern U.S. (RM-217) and DEIS comments received from both Arizona and New Mexico game and fish agencies.

## **MEXICAN SPOTTED OWL**

**Standards:** Provide three levels of habitat management - protected, restricted, and other forest and woodland types to achieve a diversity of habitat conditions across the landscape.

Protected areas include delineated protected activity centers; mixed conifer and pine-oak forests with slopes greater than 40% where timber harvest has not occurred in the last 20 years; and reserved lands which include wilderness, research natural areas, wild and scenic rivers, and congressionally recognized wilderness study areas.

Restricted areas include all mixed-conifer, pine-oak, and riparian forests outside of protected areas.

Other forest and woodland types include all ponderosa pine, spruce-fir, woodland, and aspen forests outside protected and restricted areas.

Survey all potential spotted owl areas including protected, restricted, and other forest and woodland types within an analysis area plus the area 1/2 mile beyond the perimeter of the proposed treatment area.

Establish a protected activity center at all Mexican spotted owl sites located during surveys and all management territories established since 1989.

Allow no timber harvest except for fuelwood and fire risk abatement in established protected activity centers. For protected activity centers destroyed by fire, windstorm, or other natural disaster, salvage timber harvest or declassification may be allowed on a case-by-case basis after consultation with US Fish and Wildlife Service.

Allow no timber harvest except for fire risk abatement in mixed conifer and pine-oak forests on slopes greater than 40% where timber harvest has not occurred in the last 20 years.

Limit human activity in protected activity centers during the breeding season.

In protected and restricted areas, when activities conducted in conformance with these standards and guidelines may adversely affect other threatened, endangered, or sensitive species or may conflict with other established recovery plans or conservation agreements; consult with US Fish and Wildlife Service to resolve the conflict.

Monitor changes in owl density and habitat needed for delisting.

### **Guidelines:**

#### **A. GENERAL**

Conduct surveys following Region 3 survey protocol.

Breeding season is March 1 to August 31.

#### **B. PROTECTED AREAS**

##### **Protected Activity Centers**

Delineate an area of not less than 600 acres around the activity center using boundaries of known habitat polygons and/or topographic features. Written justification for boundary delineation should be provided.

The Protected Activity Center boundary should enclose the best possible owl habitat configured in as compact a unit as possible, with the nest or activity center located near the center.



The activity center is defined as the nest site. In the absence of a known nest, the activity center should be defined as a roost grove commonly used during breeding. In the absence of a known nest or roost, the activity center should be defined as the best nest/roost habitat.

Protected Activity Center boundaries should not overlap.

Submit protected activity center maps and descriptions to the recovery unit working group for comment as soon as possible after completion of surveys.

Road or trail building in protected activity centers should be avoided but may be permitted on a case-by-case basis for pressing management reasons.

Generally allow continuation of the level of recreation activities that was occurring prior to listing.

Require bird guides to apply for and obtain a special use permit. A condition of the permit shall be that they obtain a subpermit under the U.S. Fish and Wildlife Service Master endangered species permit. The permit should stipulate the sites, dates, number of visits and maximum group size permissible.

Harvest fuelwood when it can be done in such a way that effects on the owl are minimized. Manage within the following limitations to minimize effects on the owl.

- Retain key forest species such as oak.
- Retain key habitat components such as snags and large downed logs.
- Harvest conifers less than 9 inches in diameter only within those protected activity centers treated to abate fire risk as described below.

Treat fuel accumulations to abate fire risk.

- Select for treatment 10% of the protected activity centers where nest sites are known in each recovery unit having high fire risk conditions. Also select another 10% of the protected activity centers where nest sites are known as a paired sample to serve as control areas.
- Designate a 100 acre "no treatment" area around the known nest site of each selected protected activity center. Habitat in the no treatment area should be as similar as possible in structure and composition as that found in the activity center.
- Use combinations of thinning trees less than 9 inches in diameter, mechanical fuel treatment and prescribed fire to abate fire risk in the remainder of the selected protected activity center outside the 100 acre "no treatment" area.
- Retain woody debris larger than 12 inches in diameter, snags, clumps of broad-leaved woody vegetation, and hardwood trees larger than 10 inches in diameter at the root collar.
- Select and treat additional protected activity centers in 10% increments if monitoring of the initial sample shows there were no negative impacts or there were negative impacts which can be mitigated by modifying treatment methods.
- Use light prescribed burns in nonselected protected activity centers on a case-by-case basis. Burning should avoid a 100 acre "no treatment" area around the activity center. Large woody debris, snags, clumps of broad-leaved woody vegetation should be retained and hardwood trees larger than 10 inches diameter at the root collar.
- Pre and post treatment monitoring should be conducted in all protected activity centers treated for fire risk abatement. (See monitoring guidelines)

**Steep Slopes (Mixed conifer and pine-oak forests with greater than 40% slopes outside protected activity centers)**

No seasonal restrictions apply.

Treat fuel accumulations to abate fire risk.

- Use combinations of thinning trees less than 9 inches in diameter, mechanical fuel removal, and prescribed fire.
- Retain woody debris larger than 12 inches in diameter, snags, clumps of broad-leafed woody vegetation, and hardwood tress larger than 10 inches in diameter at the root collar.
- Pre and post treatment monitoring should occur within all steep slopes treated for fire risk abatement. (See monitoring guidelines)

**Reserved Lands (Wilderness, Research Natural Areas, Wild and Scenic Rivers, and Congressionally Recognized Wilderness Study Areas)**

Allow prescribed natural fire where appropriate.

**C. RESTRICTED AREAS (Mixed conifer, pine-oak, and riparian forests)**

**Mixed Conifer and Pine-oak Forests (See glossary definition)**

Manage to ensure a sustained level of owl nest/roost habitat well distributed across the landscape. Create replacement owl nest/roost habitat where appropriate while providing a diversity of stand conditions across the landscape to ensure habitat for a diversity of prey species.

The following table displays the minimum percentage of restricted area which should be managed to have nest/roost characteristics. The minimum mixed conifer restricted area includes 10% at 170 basal area and an additional amount of area at 150 basal area. The additional area of 150 basal area is +10% in BR-E and +15% in all other recovery units. The variables are for stand averages and are minimum threshold values. In project design, no stands at or above the minimum threshold values should be reduced below the threshold values unless a district-wide or larger landscape analysis of restricted areas shows that there is a surplus of restricted area acres meeting the threshold values. Management should be designed to create minimum threshold conditions on project areas where there is a deficit of stands meeting minimum threshold conditions unless the district-wide or larger landscape analysis shows there is a surplus.

VARIABLE	MC ALL RU	MC BR-E RU	MC OTHER RU	PINE-OAK
Restricted area %	10%	+10%	+15%	10%
Stand Averages for: Basal Area	170	150	150	150
18 inch + trees/ac	20	20	20	20
Oak basal area	NA	NA	NA	20
Percent total existing stand density index by size class:				
12-18"	10	10	10	15
18-24"	10	10	10	15
24+ "	10	10	10	15

Attempt to mimic natural disturbance patterns by incorporating natural variation, such as irregular tree spacing and various patch sizes, into management prescriptions.

Maintain all species of native trees in the landscape including early seral species.

Allow natural canopy gap processes to occur, thus producing horizontal variation in stand structure.

Emphasize uneven-aged management systems. However, both even-aged and uneven-aged systems may be used where appropriate to provide variation in existing stand structure and species diversity. Existing stand conditions will determine which system is appropriate. Retention standards for uneven-aged management should emphasize low q-factors, high basal areas, and large target tree diameters.

Extend rotation ages for even-aged stands to greater than 200 years. Silvicultural prescriptions should explicitly state when vegetative manipulation will cease until rotation age is reached.

Save all trees greater than 24 inches dbh.

In pine-oak forests, retain existing large oaks and promote growth of additional large oaks.

Encourage prescribed and prescribed natural fire to reduce hazardous fuel accumulation. Thinning from below may be desirable or necessary before burning to reduce ladder fuels and the risk of crown fire.

Retain substantive amounts of key habitat components:

- Snags 18 inches in diameter and larger
- Down logs over 12 inches midpoint diameter
- Hardwoods for retention, recruitment, and replacement of large hardwoods

### **Riparian Areas**

Emphasize maintenance and restoration of healthy riparian ecosystems through conformance with forest plan riparian standards and guidelines. Management strategies should move degraded riparian vegetation toward good condition as soon as possible. Damage to riparian vegetation, stream banks, and channels should be prevented.

### **Domestic Livestock Grazing**

Implement forest plan forage utilization standards and guidelines to maintain owl prey availability, maintain potential for beneficial fire while inhibiting potential destructive fire, maintain and restore riparian ecosystems, and promote development of owl habitat. Strive to attain good to excellent range conditions.

### **Old Growth**

Except where otherwise noted, implement forest plan old growth standards and guidelines to maintain and promote development of owl habitat.

## **D. OTHER FOREST AND WOODLAND TYPES**

Apply ecosystem approaches to manage for landscape diversity mimicking natural disturbance patterns, incorporating natural variation in stand conditions and retaining special features such as snags and large trees, utilizing appropriate fires, and retention of existing old growth in accordance with forest plan old growth standards and guidelines.

## **E. GUIDELINES FOR SPECIFIC RECOVERY UNITS**

### **Colorado Plateau**

No special additional guidelines apply

**Southern Rocky Mountain - New Mexico**

No special additional guidelines apply

**Upper Gila Mountains**

No special additional guidelines apply

**Basin and Range - West**

Emphasize restoration of lowland riparian habitats

Management activities necessary to implement the Mt Graham red squirrel recovery plan, which may conflict with standards and guidelines for Mexican spotted owl, will take precedence and will be exempt from the conflicting Mexican spotted owl standards and guidelines.

**Basin and Range - East**

Emphasize restoration of lowland riparian habitats

Management activities necessary to implement the Sacramento Mountain thistle recovery plan, which may conflict with standards and guidelines for Mexican spotted owl, will take precedence and will be exempt from the conflicting Mexican spotted owl standards and guidelines.

**F. MONITORING GUIDELINES**

Monitoring and evaluation should be collaboratively planned and coordinated with involvement from each national forest, USFWS Ecological Services Field Office, USFWS Regional Office, USFS Regional Office, Rocky Mountain Research Station, recovery team, and recovery unit working groups.

Population monitoring should be a collaborative effort with participation of all appropriate resource agencies.

Habitat monitoring of gross habitat changes should be a collaborative effort of all appropriate resource agencies.

Habitat monitoring of treatment effects (pre and post treatment) should be done by the agency conducting the treatment.

Prepare an annual monitoring and evaluation report covering all levels of monitoring done in the previous year. The annual report should be forwarded to the Regional Forester with copies provided to the recovery unit working groups, USFWS Ecological Services field offices, and the USFWS Regional Office.

**Rangewide.**

Track gross changes in acres of owl habitat resulting from natural and human caused disturbances. Acreage changes in vegetation composition, structure, and density should be tracked, evaluated, and reported. Remote sensing techniques should provide an adequate level of accuracy.

In protected and restricted areas where silvicultural or fire abatement treatments are planned, monitor treated stands pre and post treatment to determine changes and trajectories in fuel levels; snag basal areas; live tree basal areas; volume of down logs over 12 inches in diameter; and basal area of hardwood trees over 10 inches in diameter at the root crown.

**Upper Gila Mountain, Basin and Range East, and Basin and Range West Recovery Units.**

Assist the recover team and recovery unit working groups to establish sampling units consisting of 19 to 39 square mile quadrats randomly allocated to habitat strata. Quadrats should be defined based on ecological boundaries such as ridge lines and watersheds. Quadrat boundaries should not traverse owl territories. Twenty percent of the quadrats will be replaced each year at random.

Using the sample quadrats, monitor the number of territorial individuals and pairs per quadrat; reproduction; apparent survival; recruitment; and age structure. Track population density both per quadrat and habitat stratum.

## **ECOSYSTEM MANAGEMENT IN NORTHERN GOSHAWK HABITATS**

**Standards:** Survey the management analysis area prior to habitat modifying activities including a 1/2 mile beyond the boundary.

Establish, and delineate on a map, a post-fledgling family area that includes six nesting areas per pair of nesting goshawks for known nest sites, old nest sites, areas where historical data indicates goshawks have nested there in the past, and where goshawks have been repeatedly sighted over a two year or greater time period but no nest sites have been located.

Manage for uneven-age stand conditions for live trees and retain live reserve trees, snags, downed logs, and woody debris levels through out woodland, ponderosa pine, mixed conifer and spruce-fir forest cover types. Manage for old age trees such that as much old forest structure as possible is sustained over time across the landscape. Sustain a mosaic of vegetation densities (overstory and understory), age classes and species composition across the landscape. Provide foods and cover for goshawk prey.

Limit human activity in nesting areas during the breeding season.

Manage the ground surface layer to maintain satisfactory soil conditions i.e. to minimize soil compaction; and to maintain hydrologic and nutrient cycles.

When activities conducted in conformance with these standards and guidelines may adversely affect other threatened, endangered, or sensitive species or may conflict with other established recovery plans or conservation agreements; consult with US Fish and Wildlife Service to resolve the conflict.

Within the ranges of the Kaibab pincushion cactus, *Pediocactus paradinei*, and the Arizona leatherflower, *Clematis hirsutissima arizonica*, management activities needed for the conservation of these two species that may conflict with northern goshawk standards and guidelines will be exempt from the conflicting northern goshawk standards and guidelines until conservation strategies or recovery plans (if listed) are developed for the two species.

### **Guidelines:**

#### **General**

Emphasize maintenance and restoration of healthy riparian ecosystems through conformance with forest plan riparian standards and guidelines. Management strategies should restore degraded riparian areas to good condition as soon as possible. Damage to riparian vegetation, stream banks, and channels should be prevented.

Refer to USDA Forest Service General Technical Report RM-217 entitled "Management Recommendations for the Northern Goshawk in the Southwestern United States" for scientific information on goshawk ecology and management which provide the basis for the management guidelines. Supplemental information on goshawk ecology and management may be found in "The Northern Goshawk: Ecology and Management" published by the Cooper Ornithological Society as Studies in Avian Biology No. 16. In woodland forest cover types, use empirical data to determine desired habitat conditions.

#### **Inventory**

Use the R3 survey protocol to get complete coverage of the management analysis area (Kennedy and Stahlecker 1993, as modified by Joy, Reynolds, and Leslie 1994). Management analysis areas should be entire ecosystem management areas if possible.

Complete at least one year of survey, but two years of survey should be done to verify questionable sightings, unconfirmed nest sites, etc. If nesting goshawks are found during the first year of inventory, a second year of inventory is not needed in that territory.

For areas where complete inventories cannot be done, use aerial photographs to locate vegetative structural stages (VSS) 4-6 within the project area and inventory just those sites for goshawk nest areas using R3 inventory

protocol. All uninventoried areas (VSS 1-3) will be managed to post-fledgling family area (PFA) specifications while in that stage. If, while using this inventory option, evidence suggests goshawks are present (such as finding plucking perches or molted goshawk feathers) conduct a complete inventory as outlined above.

If forests have goshawks commonly nesting in stands classified as VSS 1-3, use the complete inventory methods for those areas. There may be situations where an area is classified as a VSS 3, based on the predominant VSS class, but in actuality a combination of VSS 4 & 5 predominate the area. For those situations, use the complete inventory methods.

#### Home Range Establishment

Post-fledgling family areas (PFA) will be approximately 600 acres in size. post-fledgling family areas will include the nest sites and consist of the habitat most likely to be used by the fledglings during their early development.

Establish a minimum of three nest areas and three replacement nest areas per Post-fledgling family area. The nest areas and replacement nest areas should be approximately 30 acres in size. A minimum total of 180 acres of nest areas should be identified within each post-fledgling family area.

Nest site selection will be based first on using active nest sites followed by the most recently used historical nest areas. When possible, all historical nest areas should be maintained.

Manage for nest replacement sites to attain sufficient quality and size to replace the three suitable nest sites.

#### Management Scale

Distribution of habitat structures (tree size and age classes, tree groups of different densities, snags, dead and down woody material, etc.) should be evaluated at the ecosystem management area level, at the mid-scale such as drainage, and at the small scale of site. For example, an ecosystem management area may have the potential to maintain 20 percent in VSS 6. An analysis one scale below the ecosystem management area level will determine the VSS distribution within the ecosystem management area. An analysis at one scale above will determine VSS distribution across adjacent ecosystem management areas. Analysis of adjacent ecosystem management areas places the ecosystem management area being analyzed into perspective. Where VSS 6 is deficit within the ecosystem management area, all VSS 6 will be maintained regardless of location. However, over time, the intent is to sustain a relatively even distribution (again, based on site quality) of VSS 6 across the ecosystem management area.

#### Vegetation Management

##### Landscapes outside Goshawk post-fledgling family area's

General: The distribution of vegetation structural stages for ponderosa pine, mixed conifer and spruce-fir forests is 10% grass/forb/shrub (VSS1), 10% seedling-sapling (VSS2), 20% young forest (VSS 3), 20% mid-aged forest (VSS4), 20% mature forest (VSS 5), 20% old forest (VSS6). NOTE: The specified percentages are a guide and actual percentages are expected to vary + or - up to 3%.

The distribution of VSS, tree density, and tree age are a product of site quality in the ecosystem management area. Use site quality to guide in the distribution of VSS, tree density and tree ages. Use site quality to identify and manage dispersal PFA and nest habitat at 2 - 2.5 mile spacing across the landscape.

Snags are 18" or larger DBH and 30 feet or larger in height, downed logs are 12 inches in diameter and at least 8 feet long, woody debris is 3 inches or larger on the forest floor, canopy cover is measured with vertical crown projection on average across the landscape.

The order of preferred treatment for woody debris is: 1) prescribed burning, 2) logging & scattering, 3) hand piling or machine grapple piling, 4) dozer piling.

Spruce-Fir: Canopy cover for mid-aged forest is 1/3 60% and 2/3 40% (VSS 4), mature forest 60+% (VSS 5) and old forest 60+% (VSS6). Years required to reach mid-aged VSS 6 is 200-300 years. Maximum opening size is 1

acre with a maximum width of 125 feet. Provide two groups of reserve trees per acre with six trees per group when opening size exceeds 0.5. Leave at least 3 snags, 5 downed logs, and 10-15 tons of woody debris per acre.

Mixed Conifer: Canopy cover for mid-aged forest is 1/3 60+% and 2/3 40+% (VSS 4), mature forest 50+%, old forest 60+%. Years to reach mid-aged VSS 6 is 200-300 years. Maximum opening size is up to 4 acres with a maximum width of up to 200 feet. Retain one group of reserve trees per acre of 3-5 trees per group for openings greater than 1 acre in size. Leave at least 3 snags, 5 downed logs, and 10-15 tons of woody debris per acre.

Ponderosa Pine: Canopy Cover for mid-aged forest is 40+%, mature forest 40+%, and old forest 40+%. Years to reach mid-aged VSS 6 is 200-250 years. Opening size is up to 4 acres with a maximum width of up to 200 feet. One group of reserve trees, 3-5 trees per group, will be left if the opening is greater than an acre in size. Leave at least 2 snags per acre, 3 downed logs per acre, and 5-7 tons of woody debris per acre.

Woodland: Manage for uneven age conditions to sustain a mosaic of vegetation densities (overstory and understory), age classes, and species composition well distributed across the landscape. Provide for reserve trees, snags, and down woody debris.

Within post-fledgling family area's

General: Provide for a healthy sustainable forest environment for the post-fledgling family needs of goshawks. The principle difference between within the post-fledgling family area and outside the post-fledgling family area is the higher canopy cover within the post-fledgling family area and smaller opening size within the post-fledgling family area. Vegetative Structural Stage distribution and structural conditions are the same within and outside the post-fledgling family area.

Spruce-Fir: Canopy Cover for mid-aged forest (VSS 4) is 60+% and for mature and old forest 70+%. Years to mid-aged VSS 6 is 200-300 years.

Mixed Conifer: Canopy Cover for mid-aged to old forest (VSS 4) is 60+% with years to mid-aged VSS 6 is 200-300 years.

Ponderosa Pine: Canopy Cover for mid-aged forest is 1/3 60+%-2/3 50+%, and for mature and old forest 50+%. Years to mid-aged forest is 200-250 years.

Woodland: Maintain existing canopy cover levels.

Within Nesting Areas

General: Provide unique nesting habitat conditions for goshawks. Important features include trees of mature to old age with high canopy cover.

The structure of the vegetation within nest areas is associated with the forest type, and tree age, size, and density, and the developmental history of the stand. Table 5 of RM-217 presents attributes required for goshawks on locations with "low" and "high" site productivity.

Preferred treatments to maintain the desired structure are to thin from below with non-uniform spacing and use of handtools and fire to reduce fuel loads. Lopping and scattering of thinning debris is preferred if prescribed fire cannot be used. Piling of debris should be limited. When necessary, hand piling should be used to minimize compaction within piles and to minimize displacement and destruction of the forest floor and the herbaceous layer. Do not grapple or Dozer pile debris. Manage road densities at the lowest level possible to minimize disturbance in the nest area. Use small, permanent skid trails in lieu of roads for timber harvesting.

Spruce-fir, Mixed Conifer and Ponderosa Pine Cover Types: The nesting area contains only mature to old forest (VSS 5 & 6) having a canopy cover (measured vertically) between 50-70% with mid-aged VSS 6 trees 200-300 years old. Non-uniform spacing of trees and clumpiness is desirable.

Woodland: Maintain existing canopy cover levels.

#### Human Disturbance

Limit human activities in or near nest sites and post-fledgling family area's during the breeding season so that goshawk reproductive success is not affected by human activities.

The breeding season extends from March 1 through September 30.

Low intensity ground fires are allowed at any time in all forested cover types, but high intensity crown fires are not acceptable in the post-fledgling family area or nest areas. Avoid burning the entire home range of a goshawk pair in a single year. For fires planned in the occupied nest area, a fire management plan should be prepared. The fire management plan should minimize the risk of goshawk abandonment while low intensity ground fire burns in the nesting area. Prescribed fire within nesting areas should be planned to move with prevailing winds away from the nest tree to minimize smoke and risk of crown fire developing and driving the adults off or consuming the nest tree.

#### Ground Surface Layer (All forested cover types)

Manage road densities at the lowest level possible. Where timber harvesting has been prescribed to achieve desired forest condition, use small, skid trails in lieu of roads.

Piling of debris should be limited. When necessary, hand or grapple piling should be used to minimize soil compaction within piles and to minimize forest floor and herbaceous layer displacement and destruction.

Limit dozer use for piling or scattering of logging debris so that the forest floor and herbaceous layer is not displaced or destroyed.

### GRAZING MANAGEMENT

**Standards:** Control forage utilization by grazing ungulates based on range condition class and management strategy.

**Guidelines:** Identify key ungulate forage monitoring areas. These key areas will normally be 1/4 to 1 mile from water, located on productive soils on level to intermediate slopes, and be readily accessible for grazing. Size of the key forage monitoring areas could be 20 to 500 acres. In some situations such as high mountain meadows with perennial streams, key areas may be closer than 1/4 mile from water and less than 20 acres. Within key forage monitoring areas, select appropriate key species to monitor average allowable use.

Average key species forage utilization in key forage monitoring areas by domestic livestock and wildlife should not exceed levels in the following table during the forage growing season.

ALLOWABLE USE GUIDE (percent) BY RANGE CONDITION AND MANAGEMENT STRATEGY

Range Condition*	Continuous Season-long Use	Defer 1 yr. in 2	Defer 1 yr. in 3	Defer 2 yr. in 3	Rest 1 yr. in 2	Rest 1 yr. in 3	Rest 2 yr. in 3	Rest over 2 yr. in 3
Very Poor	0	10	5	15	15	10	20	25
Poor	10	20	15	20	20	15	30	35
Fair	20	25	20	30	30	25	40	45
Good	30	35	35	35	35	35	45	50
Excellent	30	35	35	35	35	35	45	50



\*Range Condition as evaluated and ranked by the Forest Service is a subjective expression of the status or health of the vegetation and soil relative to their combined potential to produce a sound and stable biotic community. Soundness and stability are evaluated relative to a standard that encompasses the composition, density, and vigor of the vegetation and physical characteristics of the soil.

The above table is based on composition and climatic conditions typical of sites below the Mogollon Rim. On sites with higher precipitation and vegetation similar to sites above the Mogollon Rim, allowable use for ranges in poor to excellent condition under deferment or rest strategies may be increased by 5%. The guidelines established in the above table are applicable only during the growing season for the identified key species within key areas. Allowable use for key forage species during the dormant season is not covered in the above table. These guidelines are to be applied in the absence of more specific guidelines currently established through site specific NEPA analysis for individual allotments.

Guidelines for allowable use for specific allotment(s) management or for grazing strategies not covered in the above table may vary on a site specific basis when determined through the Integrated Resource Management (IRM) process.

Allowable use guidelines may be adjusted through the land management planning revision or amendment process. Guidelines established through this process to meet specific ecosystem objectives, will also employ the key species and key area concept and will be monitored in this manner.

## **OLD GROWTH**

**Standards:** Until the forest plan is revised allocate no less than 20 percent of each forested ecosystem management area to old growth and retain all existing ponderosa pine old growth stands as depicted in the table below.

In the long term, provide as much old growth as can be sustained in patterns that provide for a flow of functions and interactions at multiple scales across the landscape through time.

Allocations will consist of landscape percentages meeting old growth conditions and not specific acres.

**Guidelines:** All analyses should be at multiple scales - one scale above and one scale below the ecosystem management areas. The amount of old growth can be provided and maintained will be evaluated at the ecosystem management area level and be based on forest type, site capability, and disturbance regimes.

Strive to create or sustain as much old growth compositional, structural, and functional flow as possible over time at multiple areal scales. Seek to develop or retain old growth function on at least 20 percent of the naturally forested area by forest type in any landscape.

Use information about pre-European settlement conditions at the appropriate scales when considering the importance of various factors.

Consider the effects of spatial arrangement on old growth function, from groups to landscapes, including de facto allocations to old growth such as goshawk nest sites, Mexican spotted owl protected activity centers, sites protected for species behavior associated with old growth, wilderness, research natural areas, and other forest structures managed for old growth function.

In allocating old growth and making decisions about old growth management, use appropriate information about the relative risks to sustaining old growth function at the appropriate scales, due to natural and human-caused events.

Use quantitative models at the appropriate scales when considering the importance of various factors. These models may include, but are not limited to: Forest Vegetation Simulator, BEHAVE, and FARSITE.

Forested sites should meet or exceed the structural attributes to be considered old growth in the five primary forest cover types in the southwest as depicted in the following table.

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The Minimum Criteria for the Structural Attributes Used to Determine Old-growth.

FOREST COVER TYPE, NAME	Pinyon-Juniper		Interior Ponderosa Pine		Aspen	Mixed-Species Group		Engelmann Spruce Subalpine Fir	
FOREST COVER TYPE, SAF CODE	239		237		217	210,211,216,219		206, 209	
SITE CAPABILITY POTENTIAL BREAK BETWEEN LOW AND HIGH SITE			55 Minor			50 Douglas-Fir Edminster & Jump		50 Engelmann Spruce Alexander	
SITE	LOW	HIGH	LOW	HIGH	ALL	LOW	HIGH	LOW	HIGH
1. LIVE TREES IN MAIN CANOPY									
TREES/ACRE	12	30	20	20	20	12	16	20	30
DBH/DRC	9"	12"	14"	18"	14"	18"	20"	10"	14"
AGE (YEARS)	150	200	180	180	100	150	150	140*/170**	140*/170**
2. VARIATION IN TREE DIAMETERS (YES OR NO)	ND	ND	ND	ND	No	ND	ND	ND	ND
3. DEAD TREES									
STANDING									
TREES/ACRE	0.5*	1	1	1	ND	2.5	2.5	3	4
SIZE, DBH/DRC	9"	10"	14"	14"	10"	14"	16"	12"	16"
HEIGHT (FEET)	8'	10'	15'	25'	ND	20'	25'	20'	30'
DOWN									
PIECES/ACRE	2	2**	2	2	ND	4	4	5	5
SIZE (DIAMETER)	9"	10"	12"	12"	ND	12"	12"	12"	12"
LENGTH (FEET)	8'	10'	15'	15'	ND	16'	16'	16'	16'
4. TREE DECADENCE TREES/ACRE	ND	ND	ND	ND	ND	ND	ND	ND	ND
5. NUMBER OF TREE CANOPIES	SS/MS	SS/MS	SS/MS	SS/MS	SS	SS/MS	SS/MS	SS/MS	SS/MS
6. TOTAL BA, SQUARE FEET/ACRE	6	24	70	90	ND	80	100	120	140
7. TOTAL CANOPY COVER, PERCENT	20	35	40	50	50	50	60	60	70

PINYON-PINE \* Dead limbs help make up dead material deficit. \*\* Unless removed for firewood or fire burning activities.  
 SPRUCE-FIR \* In mixed corkbark fir and Engelmann spruce stands where Engelmann spruce is less than 50 percent composition in the stand.

\*\* In mixed corkbark fir and Engelmann spruce stands where Engelmann spruce is 50 or more percent composition in the stand. ND is not determined; SS is single-storied; MS is multi-stories